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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/632,235	08/04/2000	Allan Tzungren Tzeng	SUN-P4497	1869

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EXAMINER

DO, CHAT C

ART UNIT	PAPER NUMBER
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2124

DATE MAILED: 04/07/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/632,235

Applicant(s)

TZENG ET AL.

Examiner

Chat C. Do

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. This communication is responsive to Amendment A, filed 03/01/2004.
2. Claims 1-7 are pending in this application. Claims 1 and 4-7 are independent claims. In Amendment A, claims 1 and 4-7 are amended. This action is made final.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re claim 1, it is mis-descriptive by the limitation “a rounding calculator ...the adder unit” in lines 18-20 because the EAC bit computation requires a carry-out value bit from either the mantissa adder (e.g. 214 in Figure 2) or a mantissa adder in the compare unit (e.g. 204 in Figure 2). These two mantissa adders would take same amount of processing time for adding mantissa. Therefore, the rounding choice should be done after the adder unit completing. For examination purposes, the examiner considers the rounding choice is done or processed after the adder unit completing. Claims 4-7 have similar problem as cited above.

Thus, claims 2-3 are also rejected for being dependent on the rejected claim 1.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Oberman et al. (U.S. 6,298,367).

Re claim 1, Oberman et al. disclose in Figure 6 processor comprising: at least one local store designed to contain a plurality of floating point values (from input unit 210); at least one floating point execution unit (230), floating point execution unit further including a separator configured to retrieve plurality of floating point values from local store and make available a mantissa portion (M_A and M_B) from and corresponding to each of plurality of floating point values, floating point execution unit further including at least one adder unit (340) configured to receive mantissas in order and number determined by adder unit (output of 340); a compare unit (308) operatively coupled to at least one local store further comprising a separator configured to retrieve plurality of floating point values from local store and make available at least a mantissa portion of each of floating point values (E_B and E_A), and a comparison unit configured to make available a carry-out bit value resulting from an addition of mantissas portions; and, an end-around-carry bit calculator unit (320) operatively coupled to compare unit and configured to provide a correct value of an end-around-carry calculation available as output, based on values received from compare unit (350 and 360); and a rounding

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calculator operatively coupled to the end-around-carry bit calculator to calculate a rounding choice prior to the adder unit completing the addition and communicating the choice to the adder unit.

Re claim 2, Oberman et al. further disclose in Figure 9 compare unit further comprises as a component contained therein end-around-carry bit calculator unit (320).

Re claim 3, Oberman et al. further disclose in Figure 9 at least one floating-point execution unit further comprises as a component therein end-around-carry bit calculator unit (Figure 10).

Re claim 4, Oberman et al. further disclose in Figure 6 a machine readable medium containing a data structure having an instruction therein for determining which values from a local store containing floating point values to send to a floating point execution unit (From Input Unit 210), and in parallel to a compare unit (308 and 340), where compare unit and floating point execution unit are operatively coupled to an EAC value calculator (350 and 360).

Re claim 5, Oberman et al. further disclose in Figure 9 method for providing a correct rounding choice for floating point subtraction (202 control) comprising: (a) providing a first floating point value having a sign, an exponent, and a mantissa (M_A and E_A); (b) providing a second floating point value having a second sign, a second exponent, and a second mantissa (M_B and E_B); (c) performing a compare of two floating point values while starting a subtraction of first and second mantissas (308); (d) calculating an end-around-carry value using results from compare (350); (e) using end-around-carry

value to calculate a rounding choice (320); and, (f) providing rounding choice before subtraction is complete (320 before 340).

Re claim 6, Oberman et al. further disclose in Figure 9 method for providing increased parallelism in a processor comprising: (a) providing a first floating point value having a sign, an exponent, and a mantissa (M_A and E_A); (b) providing a second floating point value having a second sign, a second exponent, and a second mantissa (M_B and E_B); (c) starting in parallel a compare of first and second floating point values (308) and an addition of first and second floating point values (340), where addition is using the 2's complement form of second mantissa (336 in Figure 7); (d) using compare results to calculate an end-around-carry value (320).

Re claim 7, method for computing a floating point subtraction comprising: (a) providing a first floating point value having a sign, an exponent, and a mantissa (M_A and E_A); (b) providing a second floating point value having a second sign, a second exponent, and a second mantissa (M_B and E_B); (c) performing a compare of two floating point values and providing the output of compare to an end-around-carry calculator unit (308); (d) calculating an end-around-carry value in end-around-carry calculator unit (320); (e) sending first and second mantissas to an adder (340); (f) aligning second mantissa to first mantissa in adder (314A and 314B); (g) starting an addition of first mantissa and a two's complement form of second mantissa in adder (340); (h) providing calculated end-around-carry value before addition completes (output of 320); (i) using end-around-carry value to calculate a GRS determine a rounding choice (350); (j) completing addition in adder (output of 340); (k) using rounding choice to choose a correct rounded answer from

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addition as soon as addition is completed (350); and, (l) providing a final answer using rounding choice, first and second signs, and first and second exponents (360)(e) having an end-around-carry value before addition completes (320 prior 340).

Response to Arguments

7. Applicant's arguments filed 03/01/2004 have been fully considered but they are not persuasive.

a. The applicant argues primarily in pages 5-6 for all claims that the rounding choice is processed prior the completion of addition unit (e.g 302 in Figure 5).

The examiner respectfully admits that Figure 5 does disclose in block diagram the rounding choice is processed prior the completion of addition unit. However, the ACE bit calculation unit requires a carry-out value bit from a mantissa adder (e.g. see claim 1 lines 11-13) that nests inside the compare unit. Therefore, the rounding choice would not process prior the completion of addition unit (see additional comments in the above U.S.C 112 rejection).

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO**

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MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chat C. Do whose telephone number is (703) 305-5655. The examiner can normally be reached on M => F from 7:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chaki Kakali can be reached on (703) 305-9662. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chat C. Do
Examiner
Art Unit 2124

April 2, 2004


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SUPERVISORY PATENT EXAMINER
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